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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,313	02/12/2004	Makoto Higami	026035-00009	4085

7590 05/31/2007  
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EXAMINER
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CHU, HELEN OK

ART UNIT	PAPER NUMBER
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1745

MAIL DATE	DELIVERY MODE
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05/31/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/776,313	Applicant(s) HIGAMI ET AL.	
	Examiner Helen O. Chu	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37-CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/1/06</u>   | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

1. Applicant's Remarks/Arguments has been received on March 13, 2007.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action

***Continued Examination Under 37 CFR 1.114***

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/13/2007 has been entered.

***Claim Rejections - 35 USC § 103***

4. The rejections under 35 U.S.C 103(a), as unpatentable over Diebert et al. (US Patent 3, 442, 715) in view of Joshi et al. (US Patent 5,454,922) on claims 1-5 are maintained. For purposes of convenience, the rejection is repeated below.
5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Diebert et al. (US Patent 3, 442, 715) in view of Joshi et al. (US Patent 5,454,922).

In regard to claims 1, 2 and 5, the Diebert et al. reference discloses a fuel cell comprising electrode material made of carbon black (Column 1, Line 35), a platinum catalyst (Column 6, Lines 20), an organic liquid containing a dispersion medium with both high and low boiling point alcohols and water (Columns 3 and 4, Lines 70-75 and 1-20, 52-54). It is inherent that Since alcohols with boiling points of 100 to 200°C are disclosed by the Diebert et al. reference, the alcohols would inherently have intrinsic properties of a boiling point of 100 to 200°C and a solubility parameter of 7.5 to 13 (cal/mol)<sup>1/2</sup> because the compound is the same as the recitation of the element in the specification. Though, the Diebert et al. reference discloses an ion exchange membrane it does not disclose an electrolyte used as part of the electrode paste. However, the Joshi et al. reference uses an electrolyte (Nafion) as a binder for the electrodes (Column 2, Lines 16-20). Therefore, it would be obvious to one of ordinary skill at the time the invention was made to incorporate Nafion as disclosed by Joshi et al. to the electrode paste as disclosed by Diebert et al. in order to improve the adhesion of the electrode to the ion-exchange membrane.

In regards to claim 3, the Diebert et al. reference also discloses dispersing agent (Column 4, Line 72) in the electrode paste.

In regards to claim 4, the Diebert et al. reference further discloses a fiber may be included of a conductive material such as carbon.

***Response to Arguments***

7. Applicant's arguments filed March 13, 2007 have been fully considered but they are not persuasive.

Applicant's principal arguments are

a) (the Diebert reference) "does teach or suggest a paste composition for making electrodes which comprises both an organic solvent with a boiling point of 100-200 C and a water soluble organic solvent with a boiling point of 100-200C"

b) Applicants submit that Dieber et al. does not disclose or suggest the unexpected and remarkable effects of having a paste composition for making electrodes

c) Applicants submit that based on the teachings of Diebert et al. and without the benefit of hindsight, one of ordinary skill in the art would not have known that compositions of the presently claimed invention would have these unexpected results.

d) Joshi et al. Joshi et al. merely generally discloses "a fluid-dispensing, electrochemical pump... [which] utilizes an electrochemical cell having a thin-walled, substantially non-porous polymeric ionomer, such as polyperfluoro-sulfonated ethylene, which has one ionic/electronic conducting electrode capable of reducing oxygen in the presence of water or protons and another electronic/ionic conducting electrode suitable for oxygen evolution" (Joshi et al., col. 3, lines 3-9). Applicants submit that although Joshi et al. generally mentions the use of "alcohols and water" and glycerol in ink preparation (Joshi et al., col. 10, lines 13-14), Joshi et al. fails to teach or suggest a composition with "an organic solvent with a boiling point of 100 to 200°C and a water-soluble organic solvent with a boiling point of less than 100°C" (claim 1). For example,

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glycerol is known to have a boiling point of 290°C, and therefore, it is not an organic solvent with a boiling point of 100 to 200°C or a boiling point of less than 100°C.

Further, like Deibert et al., Joshi et al. fails to teach or suggest a composition with improved storage stability and increased pore volume, much less what is necessary to achieve such properties.

As such, Applicants submit that Deibert et al. and Joshi et al. fail to teach or suggest all of the elements of the presently claimed invention, as set forth in

In response to Applicant's arguments please consider the following.

a) Diebert states "various alcohols...both with lower and higher boiling (temperature) than water" (Column 4, Lines 5-25) It is known by one skilled in the art that the boiling temperature of water is 100 C. Furthermore, Column 4, Lines 52-54 states "mixtures of organic liquids such as those above listed can be employed." It is known to one of ordinary skill in the art that a mixture of organic liquids consist of two or more organic liquids.

b) and c) Whether the Diebert in view of Joshi et al. reference state the advantages of the invention is irrelevant. The Diebert in view of Joshi et al. reference discloses the same invention as the Applicants and hence the extrinsic and intrinsic properties must also be the same. Furthermore, the Applicants presented arguments without further evidence that the invention disclosed by Diebert in view of Joshi et al. does not have the same properties as the instantly claimed invention. The burden is on the Applicants to provide proof with their arguments not just pure assumptions.

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d) the arguments in reference to Joshi et al. <sup>are</sup> ~~do~~ not commensurate with the scope of the rejections. The Joshi et al. was used to disclose an electrolyte in the electrode paste for fuel cells was known to one of ordinary skill in the art.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HOC



TRACY DOVE  
PRIMARY EXAMINER

5/07